
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: May 2013

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TABLE OF CONTENT

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT	2
2. MONITORING RESULTS.....	3
2.1 CHANNEL WATER SALINITY COMPLIANCE	3
2.2 DELTA OUTFLOW.....	3
2.3 PRECIPITATION.....	3
2.4 SUISUN MARSH SALINITY CONTROL GATES (SMSCG) OPERATIONS	4
3. DISCUSSION.....	4
3.1 FACTORS AFFECTING CHANNEL WATER SALINITY IN THE SUISUN MARSH	4
3.2 OBSERVATIONS AND TRENDS.....	4
3.2.1 <i>Conditions During the Reporting Period</i>	4
3.2.2 <i>Comparison of Reporting Period Conditions with Previous Years</i>	5
4. LIST OF FIGURES	
Figure 1: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Compliance Stations	
Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations	
Figure 3: Daily Net Delta Outflow Index and Precipitation	
Figure 4: Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations	
Figure 5: Suisun Marsh Stations	

1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per the State Water Resources Control Board (SWRCB) Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

COMPLIANCE STATIONS:		
Station Identification	Station Name	General Location
C-2*	Collinsville	Western Delta
S-64	National Steel	Eastern Suisun Marsh
S-49	Beldon's Landing	North-Central Suisun Marsh
S-42	Volanti	North-Western Suisun Marsh
S-21	Sunrise	North-Western Suisun Marsh

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh:

MONITORING STATIONS:		
Station Identification	Station Name	General Location
S-97	Ibis	Western Suisun Marsh
S-35	Morrow Island	South-Western Suisun Marsh

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

2. MONITORING RESULTS

2.1 Channel Water Salinity Compliance

During the month of May, salinity conditions at all five compliance stations were in compliance with channel water salinity standards (Table 1). Compliance with standards for the month was determined for each compliance station by comparing the progressive daily mean (PDM) of high tide SC with respective standards. The standard for May was 11.0 mS/cm. The progressive daily mean is the monthly average of both daily high tide SC values. The mathematical equation is shown below:

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days in the month}}$$

2.2 Delta Outflow

Outflow for May 2013 ranged between 8,987 cfs and 11,861 cfs (Figure 3). For the month, outflow began at 11,146 cfs, decreased to 9,129 cfs then increased to 11,861 cfs in response to a small precipitation event. Outflow then decreased and stayed at an average of 9,500 cfs and ended the month at 10,488 cfs. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for May 2013 is listed below:

Month	Mean NDOI (cubic feet per second)
May	9,977

2.3 Precipitation

Precipitation for May totaled 0.37 inch. One small event occurred during the month. The event produced 0.36 inch of rain and fell between May 6-7. Data was recorded at the Fairfield Water Treatment Plant with the exception of May 11th and May 22nd. Data from the Stockton Fire Station was used for these two dates. The monthly total precipitation is below:

Month	Total Precipitation (inches)
May	0.37

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during May 2013 are summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
May 1	3 Open	In	Partially Closed
May 2-9	2 Operational/1 Open	In	Partially Closed
May 10-20	3 Operational	In	Partially Closed
May 21-29	3 Open	In	Partially Closed
May 30-31	3 Open	Out	Closed

Given the dry conditions in May, operation of the radial gates began on May 2nd. On start-up, only two of the gates were operational, the third gate malfunctioned and was kept in the open position. A damaged brake was repaired on gate 3 and it became operational on May 10th. Gate operations sufficiently lowered salinity levels so operation of the gates stopped on May 21st. The flashboards were removed and the boat locks closed on May 30th.

3. DISCUSSION

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- Delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions During the Reporting Period

For May 2013, PDM salinity levels at compliance stations Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ended the month between 3.75 mS/cm and 7.62 mS/cm as shown in Figure 1. Salinity levels for May started in the range

of 4.32 mS/cm to 11.45 mS/cm and gradually decreased in response to the operation of the radial gates. Salinity leveled off after the gates stopped operating on May 21st.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) are shown in Figure 2. Both stations had a decrease in salinity levels, but the decrease was not as dramatic as that of the compliance stations. Data for S-35 failed QA/QC for May 1-16. The salinity for S-35 was 10.37 mS/cm on May 17th and 9.76 mS/cm on May 31st. Salinity for S-97 started the month at 12.08 mS/cm and ended the month at 10.81 mS/cm.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high tide SC at the compliance and monitoring stations for May 2013 were compared with means for those months during the previous nine years (Figure 4).

May's mean salinity pattern for all compliance and monitoring stations ranked the highest in salinity levels for the past 10 years. The pattern came close to matching that of 2008 which was a critical water year type. May's salinity levels are double the salinity levels of 2005, 2006, 2010, 2011, and 2012. As expected, the salinity levels gradually increased from east to west.

**Table 1: Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations
May 2013**

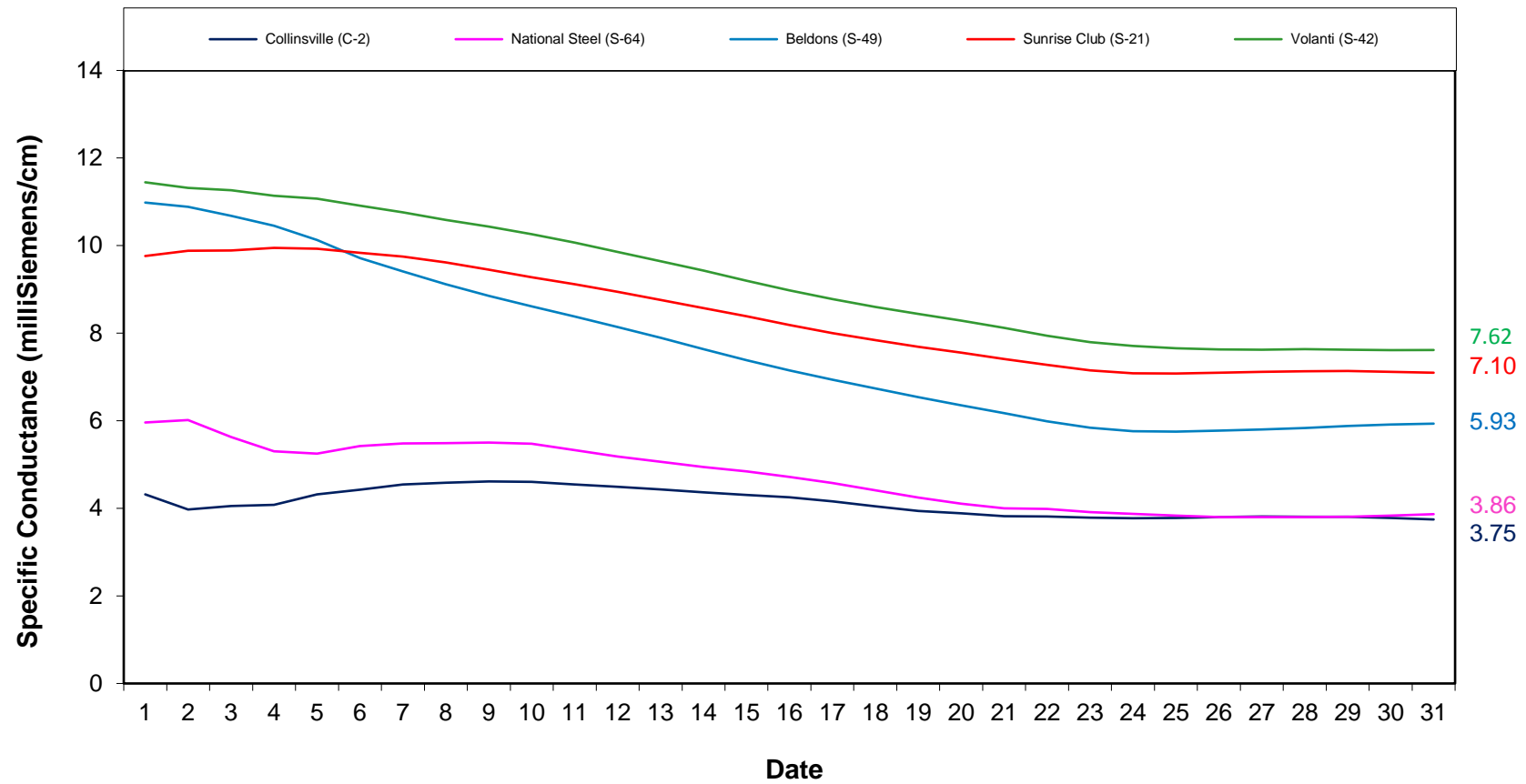
Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	3.75	11.0	Yes
S-64	3.86	11.0	Yes
S-49	5.93	11.0	Yes
S-42	7.62	11.0	Yes
S-21	7.10	11.0	Yes

*milliSiemens per centimeter

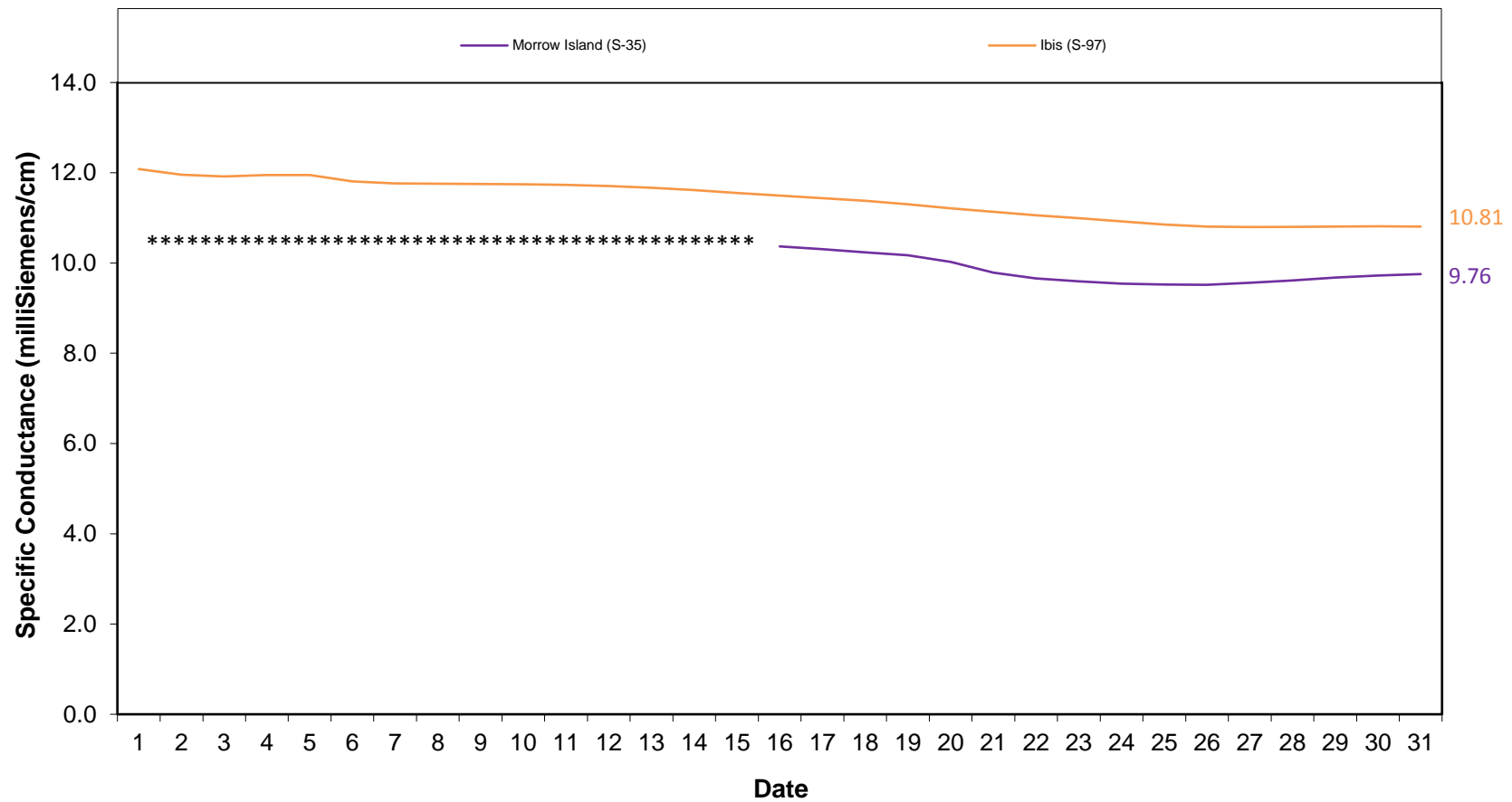
**The representative data from nearby USBR station is used in lieu of data from station C-2.

**Figure 1: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance
for Compliance Stations
May 2013**

Standard = 11.0 mS/cm

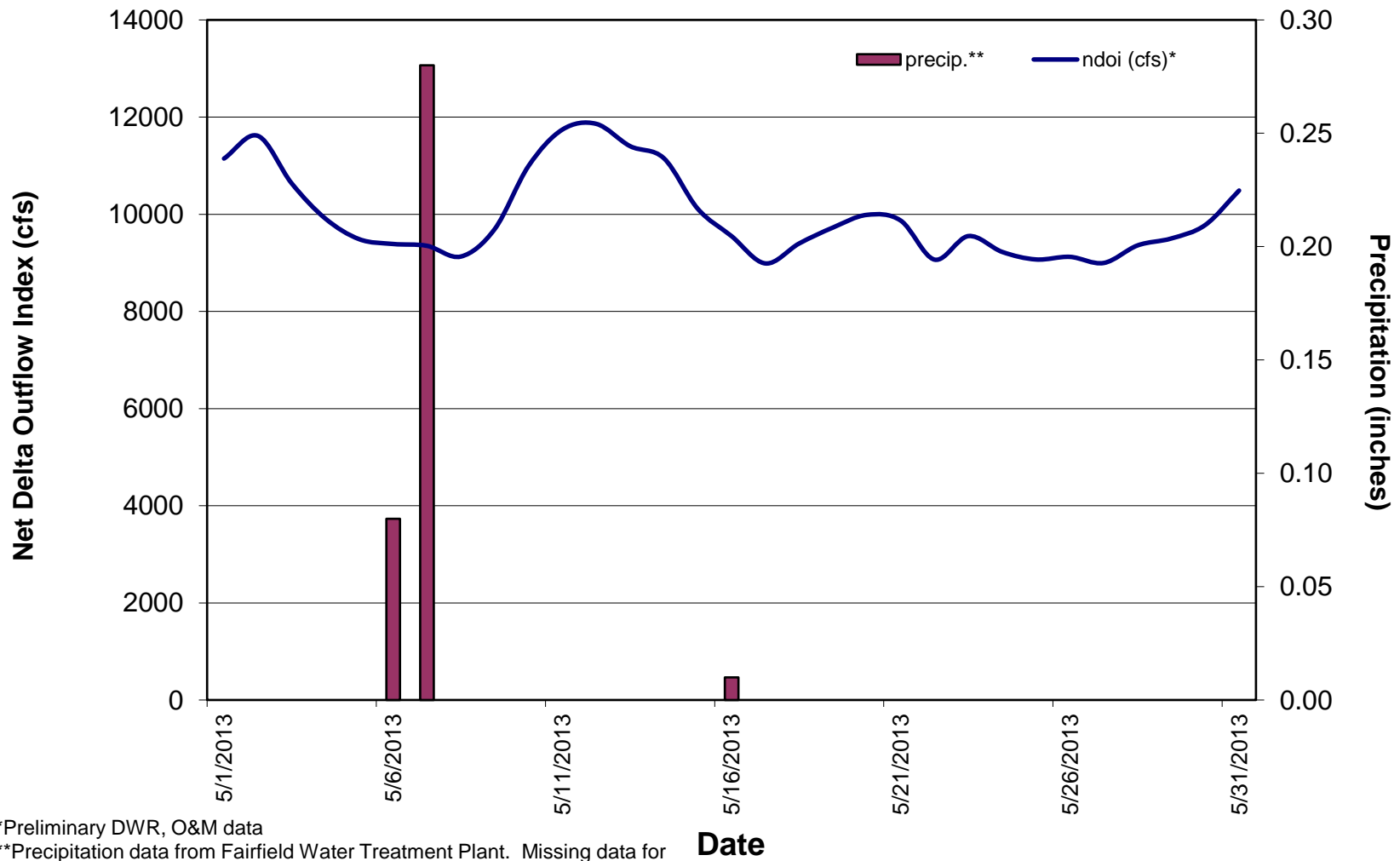


**Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance
for Monitoring Stations
May 2013**

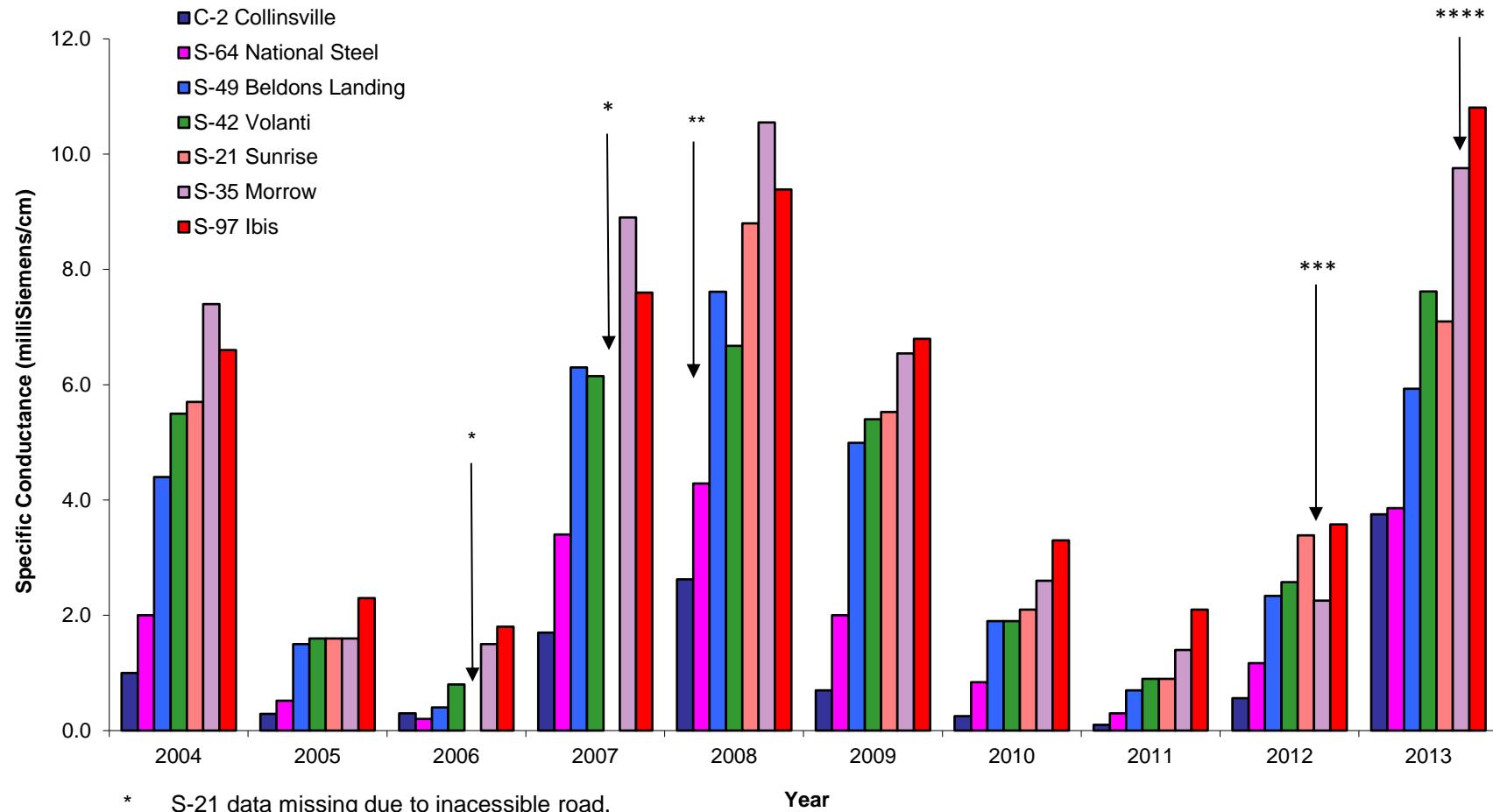


*** S-35 data for 5/1-5/16 failed QA/QC.

**Figure 3: Daily Net Delta Outflow Index and Precipitation
May 2013**



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
May of 2004-2013**



- * S-21 data missing due to inaccessible road.
- ** S-64 PDM based on last good entry (6/20/08).
- *** S-35 PDM based on last good entry (6/14/12).
- **** S-35 data for 5/1-5/16 failed QA/QC.

